Appendix D. Notes on the Use of 64-bit Data Type

cMT / cMT X Series models offer 64-bit data type support. The following explains limitations on the use of 64-bit data type.

- Input ranges (Numeric object, Set Word object…etc)
  i. unit64: 0 ~ 2^48
  ii. int64: -2^48 ~ 2^48
  iii. double: -2^48 ~ 2^48

- int64 / unit64

Double is the internal data type used in computation, while it stores a mantissa with 52-bit precision. As a result , 15-digits integers and a portion of 16-digits integers may be stored exactly, but storing numbers exceeding that may result in lost precision.
In EasyBuilder Pro, inputs exceeding 48-bit may result in error; therefore, the input limit is defined as 48-bit.

- double

In EasyBuilder Pro, the upper/lower input limit was formerly determined by the max/min of double (+/- 1.79 * 10^308), which is nearly limitless in practicality. For consistency, the upper/lower input limit is also defined as -2^48 ~ 2^48.

Example:
The value 144,115,188,075,855,872 (a 64-bit unsigned int. value) read from PLC may be displayed as 144,115,188,075,855,870 by Numeric as precision is lost.

Other circumstances:
As in the example above, the same problem may occur when using Recipe Import / SQL Query / Database (Data Sampling), where data is from an external source.

Please note that for double, as a floating-point number, precision issue is inherent. It should not be assumed that all numbers in the range +2^48 ~ -2^48 is guaranteed to display exactly. Explanations above should apply to the use of int64 / uint64 only.